

Jaemyoung (Jason) Lee

Website: astjason.com

Department of Physics and Astronomy, University of Pennsylvania

* *Address*: 209 South 33rd Street 1N11D, Philadelphia, Pennsylvania, USA, 19104-6396

* *E-mail*: astjason@sas.upenn.edu

Research Interests

SN Ia Cosmology: Wavelength-dependent atmospheric effects, astrometric/photometric redshifts
- Part of the Dark Energy Survey Supernova Working Group (DES-SN WG)
- Part of the Vera C. Rubin Observatory Legacy Survey of Space and Time - Dark Energy Science Collaboration Time Domain Working Group (LSST-DESC-TDWG)
Large Scale Structure: Baryon Acoustic Oscillations (BAO), Modified Gravity, Cosmic Infrared Background (CIB), weak gravitational lensing, higher-order statistics, time-evolving dark energy

Employment

Postdoctoral Research Associate

Advisor: Keith Bechtol

University of Wisconsin Madison

Sept. 2025 -

Postdoctoral Research Associate

Advisor: Masao Sako

University of Pennsylvania

May 2025 - Aug. 2025

Military Service as an English Interpreter

Discharged as a sergeant on March 1st, 2016

Army Signal School, South Korea

June 2014 - Mar. 2016

Education and Employment

Ph.D. Candidate in Physics and Astronomy

Advisors: Masao Sako & Ravi Sheth, M.S. in August 2022

University of Pennsylvania

Aug. 2020 - May 2025

B.S. in Physics and B.A. in English Language and Literature

Dual major

Korea University

Mar. 2013 - Feb. 2020

Study Abroad

Engaged in undergraduate research with J. Richard Bond's group

University of Toronto

Sept. 2018 - Apr. 2019

Awards and Honors

Dissertation Completion Fellowship

Department of Physics and Astronomy (University of Pennsylvania)

July 2024 - Apr. 2025

Philadelphia, Pennsylvania

Mitacs Globalink Research Award

Canadian Institute for Theoretical Astrophysics

May 2019 - Aug. 2019

Toronto, Ontario, Canada

- Funding for summer research

National Excellence Scholarship for Science and Technology Majors *Mar. 2017 - Feb. 2019*

Department of Physics (Korea University)

Seoul, South Korea

- Full funding for university tuition (4 semesters) by the Korea Student Aid Foundation

Lead author publications

- [1] **Lee J.**, Fiorini, B., Nikakhtar, F., and Sheth, R.K. (2024)
[The Stability of the BAO Linear Point under Modified Gravity](#)
arXiv: 2406.09379, submitted to Physical Review D
- [2] **Lee J.**, Sako, M., Kessler, R., Malz, A.I., and the LSST DESC Collaboration (2024)
[Astrometric Redshifts of Supernovae](#)
The Astrophysical Journal, 977, 199
- [3] **Lee J.**, Nikakhtar, F., Paranjape A., and Sheth, R.K. (2024)
[Eigen-decomposition of Covariance matrices: An application to the BAO Linear Point](#)
Physical Review D, 110, 103515
- [4] **Lee J.**, Bond J.R., Motloch P., van Engelen A. and Stein G. (2024)
[Exploring the Non-Gaussianity of the Cosmic Infrared Background and Its Weak Gravitational Lensing](#)
Monthly Notices of the Royal Astronomical Society, 529, 2543
- [5] **Lee J.** and Acevedo M., Sako M., Vincenzi M., Brout D., Sanchez B., et al. (2023)
[The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects](#)
The Astronomical Journal, 165, 222

Publications with major contributions

- [1] Doux C., Jain B., Zeurcher D., **Lee J.**, Fang, X., Rosenfeld, R., et al. (2022)
[Dark energy survey year 3 results: cosmological constraints from the analysis of cosmic shear in harmonic space](#)
Monthly Notices of the Royal Astronomical Society, 515, 1942

Publications as part of the DES-SNWG (major contributions)

- [1] DES Collaboration: Abbott T.M.C., Acevedo, M., et al. (2024)
[Dark Energy Survey: implications for cosmological expansion models from the final DES Baryon Acoustic Oscillation and Supernova data](#)
arXiv: 2503.06712, submitted to PRD
- [2] Vincenzi M., Kessler R., Shah P., **Lee J.**, Davis, T.M., Scolnic D., et al. (2025)
[Comparing the DES-SN5YR and Pantheon+ SN cosmology analyses: Investigation based on “Evolving Dark Energy or Supernovae systematics?”](#)
arXiv: 2501.06664, accepted by MNRAS
- [3] Sánchez B.O., Brout D., Vincenzi M., et al. (2024)
[The Dark Energy Survey Supernova Program: Light curves and 5-Year data release](#)
The Astrophysical Journal, 975, 5
- [4] Vincenzi M., Brout D., et al. (2024)
[The Dark Energy Survey Supernova Program: Cosmological Analysis and Systematic Uncertainties](#)
The Astrophysical Journal, 975, 86
- [5] DES Collaboration: Abbott T.M.C., Acevedo, M., et al. (2024)
[The Dark Energy Survey: Cosmology Results With 1500 New High-redshift Type Ia Supernovae Using The Full 5-year Dataset](#)
The Astrophysical Journal Letters, 973, L14

Publications as part of the DES-SNWG (minor contributions)

- [1] Toy M., Wiseman P., Sullivan M., et al. (2025)
[Reduction of the type Ia supernova host galaxy step in the outer regions of galaxies](#)
Monthly Notices of the Royal Astronomical Society, 538, 181
- [2] Dixon M., Mould J., Lidman C., et al. (2025)
[Calibrating the Absolute Magnitude of Type Ia Supernovae in Nearby Galaxies using \[OII\] and Implications for \$H_0\$](#)
Monthly Notices of the Royal Astronomical Society, 538, 782
- [3] Camilleri R., Davis T.M., et al. (2025)
[The Dark Energy Survey Supernova Program: An updated measurement of the Hubble constant using the Inverse Distance Ladder](#)
Monthly Notices of the Royal Astronomical Society, 537, 1818
- [4] Chen R., Scolnic D., Vincenzi M., et al. (2025)
[Evaluating Cosmological Biases using Photometric Redshifts for Type Ia Supernova Cosmology with the Dark Energy Survey Supernova Program](#)
Monthly Notices of the Royal Astronomical Society, 536, 1948
- [5] Shah P., Davis T.M., Vincenzi M., et al. (2025)
[Constraints on compact objects from the Dark Energy Survey five-year supernova sample](#)
Monthly Notices of the Royal Astronomical Society, 536, 946
- [6] Popovic B., Wiseman P., Sullivan M., et al. (2024)
[Modelling the impact of host galaxy dust on type Ia supernova distance measurements](#)
Monthly Notices of the Royal Astronomical Society, 534, 2263
- [7] White R.M.T., Davis T.M., Lewis G.F., et al. (2024)
[The Dark Energy Survey Supernova Program: Slow supernovae show cosmological time dilation out to \$z \sim 1\$](#)
Monthly Notices of the Royal Astronomical Society, 533, 3365
- [8] Camilleri R., Davis T.M., et al. (2024)
[The Dark Energy Survey Supernova Program: Investigating Beyond- \$\Lambda\$ CDM](#)
Monthly Notices of the Royal Astronomical Society, 533, 2615
- [9] Möller A., Wiseman P., et al. (2024)
[The Dark Energy Survey 5-year photometrically classified type Ia supernovae without host-galaxy redshifts](#)
Monthly Notices of the Royal Astronomical Society, 533, 2073
- [10] Shah P., Davis T.M., et al. (2024)
[The Dark Energy Survey : Detection of weak lensing magnification of supernovae and constraints on dark matter haloes](#)
Monthly Notices of the Royal Astronomical Society, 532, 932
- [11] Qu H., Sako M., Vincenzi M., et al. (2024)
[The Dark Energy Survey Supernova Program: Cosmological Biases from Host Galaxy Mismatch of Type Ia Supernovae](#)
The Astrophysical Journal, 964, 134

Talks

Center for Computational Astrophysics Cosmology & ML Lunch (Invited) Oct. 2024
“Wavelength-dependent atmospheric effects: Towards High-Precision Type Ia Supernova Cosmology” New York City, New York

Princeton/IAS Cosmology Lunch (Invited) “Wavelength-dependent atmospheric effects: Towards High-Precision Type Ia Supernova Cosmology”	Sept. 2024 Princeton, New Jersey
Cosmology from Home 2024 “Astrometric Redshifts of Supernovae” • https://www.youtube.com/watch?v=_hF7QZ_gbSE	June 2024 virtual
Dark Energy Survey Collaboration Meeting “DES-LSST Synergies: Wavelength-dependent Atmospheric Effects”	May 2024 S’Agaró, Spain
Fink-Brazil Workshop “Astrometric Redshifts of Supernovae in the Rubin LSST era”	May 2024 Rio de Janeiro, Brazil
LSST-DESC JuDO (Junior Members) short colloquia “The Stability of the BAO Linear Point under Modified Gravity”	March 2024 virtual
Invited Talk at Yonsei University “Exploring the non-Gaussianity of the CIB and Its Gravitational Lensing”	Dec. 2023 Seoul, South Korea
IPMU Time Domain Workshop “Astrometric Redshifts of Supernovae”	Dec. 2023 Kashiwa, Japan
Cosmology from Home 2023 “Exploring the non-Gaussianity of the CIB and Its Gravitational Lensing” • https://www.youtube.com/watch?v=CEkQ_mHEB00	July 2023 virtual
Particle Physics and Cosmology 2023 “Exploring the non-Gaussianity of the CIB and Its Gravitational Lensing”	June 2023 Daejeon, South Korea
Dark Energy Survey Collaboration Meeting “The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects”	Jan. 2023 Portsmouth, UK
ZTF-DES Supernova Cosmology Workshop “The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects”	July 2022 Stockholm, Sweden
Dark Energy Survey Collaboration Meeting “The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects”	May 2022 Durham, North Carolina

Posters

LSST Dark Energy Science Collaboration Meeting “Astrometric Redshifts of Supernovae”	July 2024 Zürich, Switzerland
Dark Energy Survey Collaboration Meeting “Astrometric Redshifts of Supernovae”	May 2024 S’Agaró, Spain
Cosmology in Miramare “Astrometric Redshifts of Supernovae”, “Exploring the non-Gaussianity of the CIB and Its Gravitational Lensing”	Sept. 2023 Trieste, Italy
CMB-S4 Collaboration Meeting “Exploring the non-Gaussianity of the CIB and Its Gravitational Lensing”	Aug. 2023 Stanford, CA

LSST Dark Energy Science Collaboration Meeting*“Astrometric Redshifts of Supernovae”**July 2023**Stanford, CA***American Astronomical Society Winter Meeting***“The Dark Energy Survey Supernova Program: Corrections on photometry due to wavelength-dependent atmospheric effects”**January 2023**Seattle, Washington*<https://aas241-aas.ipostersessions.com/?s=FB-2D-A1-75-B1-60-73-5B-AC-1F-39-E7-A1-A2-78-9B>**Teaching Experience - at the University of Pennsylvania**

ASTR001 Survery of the Universe	Teaching Assistant	<i>Fall 2020</i>
ASTR006 Solar System and Exoplanets		
PHYS151 Principles of Physics II: Electromagnetism and Radiation	Teaching Assistant	<i>Spring 2021</i>
PHYS358 Data Analysis for the Natural Sciences I	Teaching Assistant	<i>Fall 2022</i>
PHYS351 Analytical Mechanics	Teaching Assistant	<i>Spring 2023</i>
PHYS531 Quantum Mechanics (graduate course)	Teaching Assistant	<i>Fall 2023</i>
PHYS100 Foundations of Data Science	Teaching Assistant	<i>Spring 2024</i>
PHYS531 Quantum Mechanics (graduate course)	Teaching Assistant	<i>Fall 2024</i>

Mentorship Experience - at the University of Pennsylvania

Panelist and Mentor for DEEPenn STEM 2024 *Fall 2024 - present**Diversity Equity Engagement at Penn in STEM 2024: Full weekend of orientation activities for undergraduate students interested in Ph.D. programs, especially from underrepresented backgrounds**Panelist: How to Navigate the PhD Life & Build a Supportive Network & Mentor***Pathways to Ph.D. Mentor** *Fall 2023 - present**Full-day workshop and follow-up mentorship on applying to graduate schools and fellowships in the U.S.**Mentored 5 students***Penn Physics and Astronomy Peer Mentorship Program** *Fall 2022 - present**Monthly meetings with 1st year PhD students to provide guidance in research and professional development.**Mentored 6 students so far.***Penn Undergrad Emma Yao (with Professor Madhavacheril)** *June 2024 - present**Co-supervision on “Prior volume/projection effects on $w_0 w_a$ CDM using Pantheon+ data”***Penn Physics and Astronomy GRAD Mentor** *Fall 2021 - Spring 2022**Mentorship program on applying to graduate school organized by Penn Physics and Astronomy students**Mentored 2 students***Services**

Referee for ApJ, PRD and PRL *Sept. 2024 - present*

Outreach

Speaker

October 2024

Astronomy on Tap

Philadelphia, Pennsylvania

- Pub talk on “Measuring Cosmological ‘Distances’ Using Our Own Atmosphere”

Speaker

June 2022

Astronomy on Tap

Philadelphia, Pennsylvania

- Pub talk on “Where We Might Find Aliens, Under the Ice”

Volunteer

February 2019 - August 2019

AstroTours at the University of Toronto

Toronto, Ontario, Canada

- A once-a-month public event; demonstrated the WWT (World Wide Telescope) and Oculus Rift (Virtual Reality)

Volunteer

May 2019

Science Rendezvous at the University of Toronto

Toronto, Ontario, Canada

- A public event with the Department of Astronomy and Astrophysics; explained 3D printed models of several asteroid missions as well as planetary features

Skills

**Programming Languages/Tools
Languages**

Python, C++, L^AT_EX
Fully bilingual in Korean and English

Other Interests

- Violin/Piano (Currently a violinist at the Penn Symphony Orchestra, performed in 10+ concerts)
- Traveling (been to 30+ countries)